

Claims

1. A steel wire for cold forging, which has excellent low temperature impact properties, comprising 0.10 - 0.40 wt% C, 1.0 wt% or less of Si, 0.30 - 2.0 wt% Mn, 0.03 wt% or less of P, 0.03 wt% or less of S, and a balance of Fe and impurities, wherein an austenite grain size is 5 - 20  $\mu\text{m}$ , impact absorption energy is 60 J/cm<sup>2</sup> or more at -40°C, and tensile strength is 70 - 130 kgf/mm<sup>2</sup>.
2. The steel wire as set forth in claim 1, further comprising at least one component selected from the group consisting of 0.05 - 2.0 wt% Cr, 0.05 - 1.5 wt% Mo, and 0.0003 - 0.0050 wt% B.
3. A method of producing a steel wire for cold forging, which has excellent low temperature impact properties, comprising:
- rapidly heating steel, which contains 0.10 - 0.40 wt% C, 1.0 wt% or less of Si, 0.30 - 2.0 wt% Mn, 0.03 wt% or less of P, 0.03 wt% or less of S, and a balance of Fe and impurities, to a Ac3 transformation point or higher so that an austenite grain size is 5 - 20  $\mu\text{m}$ ;
- cooling the heated steel; and
- heat treating the cooled steel in such a way that tensile strength is 70 - 130 kgf/mm<sup>2</sup> at a tempering parameter (P) ranging from 21,800 to 30,000, which is expressed by a following Equation 1,

so that impact absorption energy is 60 J/cm<sup>2</sup> or more  
at -40°C,

Equation 1

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$$P = 1.8 \times (T + 273) \times (14.44 + \log t)$$

wherein, T is a tempering temperature (°C), and  
t is a tempering time (sec).

4. The method as set forth in claim 3, wherein  
10   the steel further comprises at least one component  
selected from the group consisting of 0.05 - 2.0 wt%  
Cr, 0.05 - 1.5 wt% Mo, and 0.0003 - 0.0050 wt% B.